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[Continued on next page]

(54) Title: TELECOMMUNICATIONS SERVICES APPARATUS
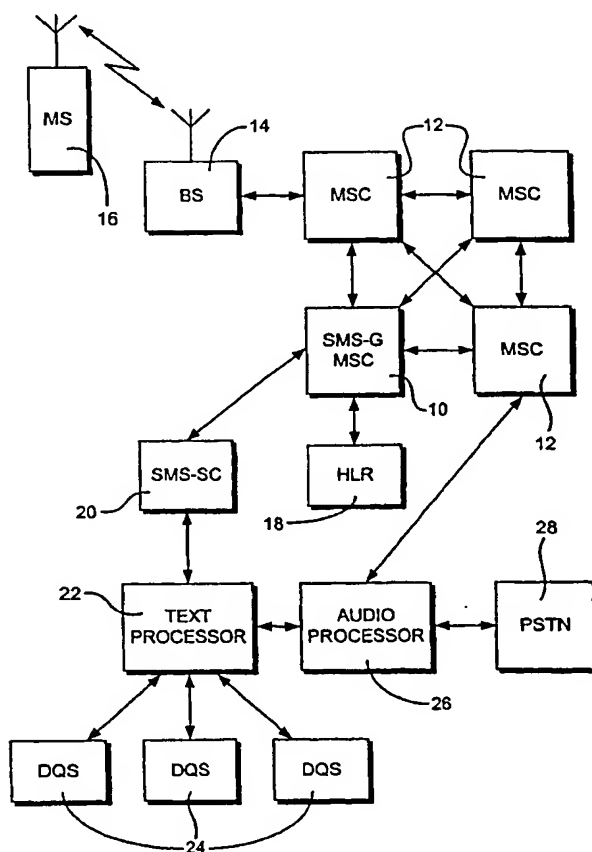
(57) Abstract: A telecomunications services apparatus for providing information in response to text message requests from a mobile terminal (16) includes a text processor (22) connected to the mobile network and to a data store (24) holding information such as directory enquiry information. The text processor (22) is also connected to an audio processor (26) which can provide audio signals such as processed speech or music. In response to a message request from the mobile terminal (16), the text processor (22) returns the associated information from the data store (24) and/or audio from the audio processor (26) to the mobile terminal (16) or to another terminal.

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

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Telecommunications Services Apparatus

This invention relates to telecommunications services apparatus, and in particular to such apparatus which may be utilised to provide information upon request, such as in directory enquiries.

5   Traditional directory enquiries services on fixed and mobile telephone networks have a number of disadvantages. Typically a caller will only be given one or two numbers per call, and will often pay a significant charge for the service. The service is also not private, because the caller's request may be overheard by persons nearby. Also the caller often has to know the area or town where the company is based

10   before the directory service will help him. In some cases one can opt for existing directory services to complete the call to the number obtained, but this is usually at a high tariff. If the caller does not opt for connection, then he needs to write down, re-type or remember the number given.

This situation has arisen because directory services have historically been

15   based around the fixed network, which still predominantly uses handsets with limited functionality, and no easy means to enter and display text. This has required the use of large numbers of operators, which makes the directory service very expensive to run, and this cost is passed on to the users. The grade of service provided can also be poor at times, especially late at night, if the number of operators provided is low.

20   There are several different types of number for which directory enquiry services can be useful:

(1)   numbers of friends

(2)   numbers of business associates

(3)   national numbers of named companies

25   (4)   numbers of generic suppliers, e.g. glass, car insurance

(5)   local numbers for tradesmen, businesses etc

One network operator currently provides an e-mail service based on the Short Message Service (SMS). The user's e-mail address is his mobile phone

30   number@<network operator>.net. To send an e-mail, the recipient address followed by the text of the message is entered as an SMS message and then sent to a short

(typically three digit) number which is the network operator's e-mail server. This allows SMS messages to be directed to the server, and portions of the content to be automatically stripped out and interpreted.

SMS technology allows alphanumeric entry using a standard handset, while the display provides user feedback. This is a good and well established interface for entering any kind of text or numbers into a mobile handset.

Handset technology also allows SMS messages received by the handset to have telephone numbers extracted from them. The number may be selected from those extracted and then dialled.

Databases are also known technology, where for example a telephone number can be looked up using a name as a key. For this to work on a large database, known hashing techniques are required to make the database searching efficient.

Companies can usually be found on the Internet simply by accessing www.<company>.com or www.<company>.co.uk (for a UK company.) This universal scheme is powerful but does not currently have any counterpart in the telephone network.

The present invention provides a telecommunications services apparatus for use in operative association with a telecommunications system, said telecommunications system having a plurality of communications terminals which provide a facility for telecommunications, said telecommunications apparatus comprising

-       a text processor coupled to said telecommunications system and also coupled to an associated data store which has stored therein information capable of association with data entered from a communications terminal and so organised that in response to data entered from a communications terminal the text processor will return the associated information from the data store to the said communications terminal and/or to another selected communications terminal.

A preferred embodiment of this invention makes it possible to quickly find out the telephone number of any company or organisation by using either the Short Message Service (SMS) currently available on mobile networks or any other means of sending text messages on current or future telephony networks. The system can also be used to retrieve other alphanumeric or audio information about the target organisation.

It is envisaged that this technique could be used initially for local and national numbers for named businesses, but could alternatively be used or extended to cover generic products and services. This allows the preferred apparatus to fulfil the needs currently covered by Business directories and Yellow Pages type directories at the local and national level.

The preferred apparatus may actually provide a better service than existing directory enquiries for these types of numbers. It removes some of the difficulties with existing directory services by making use of the features of SMS, which allow easy text entry and display. Directory enquiry style retrieval can be done quickly and silently from a mobile handset which makes the system convenient to use even in a public place. There is no need to remember or write down any numbers, and the system can return multiple numbers at once, complete with annotation and even advertising or special offers. It would not be necessary to know the location of the organisation whose number is required. The system can also optionally allow call completion so that the user can be connected directly to the organisation of his choice.

The service is very attractive for mobile operators and their customers, and can give a unique marketing advantage because it provides an improved version of business directory enquiries. It may also attract increased call revenue from SMS messages sent and calls completed. It requires no operators, and so is cost effective to run. It is also very attractive for the customers that are companies subscribing to the telephone number database, since their number will be immediately available to any customers of the mobile network who wish to contact them. Whereas a Yellow Pages type service is regional with many volumes covering the country, this service has the potential to support both regional and national directory access. Traditional directory services are static, and also very limited in the amount of information they provide. The present technique allows the directory information to be dynamic. The SMS message sent from the database could contain information about a current special offer for example in addition to telephone numbers, opening times, and services available. The messages could be geographically targeted, even down to the GSM cell level. For example, a customer who enters the text:

french restaurant

as his SMS message, could receive targeted details or offers from French restaurants in the vicinity.

In its preferred embodiment, the service uses SMS both for transmitting the request to the network and for delivering the number and other information back to the

5   user. Optional call completion could be achieved either by the network ringing back the caller, or by a handset modification which would allow an audio call to be set up in parallel with the requesting SMS message. Some handsets allow SMS messages to be composed, sent, received and read during a voice call, but most do not allow all of these at present.

10   Thus it will be apparent that the preferred technique provides a valuable service which can be made available on any mobile handset which can support SMS. While it has been possible for some considerable time on the Internet to find details of almost any major company simply by entering the URL (uniform resource locator) address www.<company>.com or www.<company>.co.uk (for a UK company) this is not

15   currently possible with the telephone network. Directory enquiries is a partial and often expensive solution, and usually requires the caller to know the location of the company in question. The preferred technique allows the user to find out the access-number which a company chooses to publish, quickly, silently and without having to know any more than the company name. The number is delivered back to the user by

20   SMS, from where the user can extract it and dial it. Alternatively automatic call completion can be offered.

An embodiment of the invention will now be described, by way of example only, with reference to the accompanying single figure drawing which shows a block diagram of a mobile telephone text processing and telecommunications services

25   system embodying the invention.

Referring to the drawing, a mobile telephone text processing system is shown associated with a telecommunications services system. The mobile telephone text processing system includes an SMS gateway mobile switching centre (MSC) 10 connected to a number of mobile switching centres 12, which are also interconnected.

30   One of the mobile switching centres 12 is shown connected to a base station 14 which is shown in radio communication with a mobile station 16. The SMS gateway MSC 10 is also connected to a home location register 18 and to an SMS service centre 20.

The SMS service centre 20 is connected to a text processor 22 which has access to one or more directory enquiry servers 24. The text processor 22 is also connected to an audio processor 26 which has access to one or both of a mobile switching centre 12 and to the public switched telephone network (PSTN) 28.

5   With reference to operation of the mobile telephoning text processing system, for an SMS message sent from a mobile station 16 via the base station 14, the receiving mobile switching centre 12 forwards the message directly to the SMS gateway MSC 10 which passes it on to the SMS service centre 20. If the SMS message is identified as one intended for the telecommunications services system, it is

10   sent to the text processor 22. For a return SMS message arriving from the SMS service centre 20 at the SMS gateway MSC 10, the mobile switching centre interrogates the home location register (HLR) 18 to determine the current location of the mobile station 16 for which the message is intended. The SMS message is then passed to the appropriate mobile switching centre 12 and sent via the respective base

15   station 14 to the mobile station 16.

When an incoming SMS message is recognised as a request for information, such as a directory enquiry, the message is sent to the (or the appropriate) directory enquiry server 24. A database in (or associated with) the DQS 24 is then checked for the relevant information which is sent back in SMS form as described above.

20   The preferred technique is also applicable to corporate or closed user group directories. By directing the SMS request to a different server, for example one operated by a company, an employee of the company could automatically be authorised by his CLI or handset identity, and then have directory access to a database of information, which could include telephone numbers, e-mail addresses, mobile

25   numbers, fax numbers etc. of other employees, customers, business associates and so on. The system is especially useful for telephone number retrieval since existing handset features allow telephone numbers to be extracted from SMS responses and dialled without the user having to remember or re-type the number.

The text processor 22 can be so organised using known string matching

30   techniques that partial, mis-spelt or otherwise incorrect inputs can be correctly interpreted and used to generate the desired output.

The system also allows audio information to be received by the user. One way to do this is for the SMS message to be sent to a different number, which would cause the directory lookup to access the world wide web page for the company name requested. An alternative is for the web address to be entered directly in the SMS

5   message. The system would then attempt to retrieve an audio file from the web site. This could be in a defined subdirectory e.g. /SMS . If this audio file was found then a call would be established to the mobile phone and the audio file would be transcoded if necessary and played to the user. If the audio file was not found then a standard message could be played by the system. Interaction could be possible during the audio

10   file play, opening up the possibility of all kinds of advertising and services. Typically the audio file would contain information or advertising about the company or service which the user has named, and this could be presented in parallel with the SMS reply described above.

As shown in the drawing, the audio processor 26 is coupled to the text

15   processor 22 such that, in response to an appropriate SMS request, the audio processor 26 generates and delivers information via either the mobile network or, if desired, via the PSTN 28 to a fixed network telephone.

SMS could also be used to select music to be played over the mobile network. With the advent of the Universal Mobile Telephony System (UMTS 2000) sufficient

20   data bandwidth will be available to the mobile terminal to allow the transfer of real-time hi-fi stereo audio, encoded for example as MPEG Layer 3 (MP3) which requires around 128 kbit/s. The combination of SMS with powerful search engines would enable users to find and select the music of their choice and have it played to them on demand, at any time or place. As an alternative, the system may allow for the audio to

25   be delivered to a different number, such as via a fixed network (PSTN 28). This different number could be included in the original SMS request, or enterd subsequently following an enquiry from the system.

The directory enquiry service as described above could be configured to provide other information and in particular the associated database could provide

30   language translation capability. There would then be no need to carry dictionaries as at all times translation could be provided quickly over the mobile telephone network. This is particularly relevant for many individuals who have some command of a

foreign language but still need to look up words from time to time. This capability could be so structured for one's native language so as to provide a word finder and/or anagram capability as found in current electronic word finder devices or some books which provide crossword solving assistance.

5   The concept can be further extended to any other information field, e.g. medicines, travel, tourism etc. and in such cases use of the handset would be much simplified if the SMS message could be sent to a destination that can be defined alphanumerically in addition to the current techniques of using numeric destinations (usually telephone numbers.) As an example the SMS message:

10   **aspirin**

could be sent to the destination:

medicines

in order to retrieve information about this particular item.

Another example of a possible use according to an embodiment of this

15   invention will now be described. A mobile network may offer as a service the provision of subscriptions from a large number of companies which entitle those companies to an entry or entries in a database operated by the mobile network. The database allows a text string containing one or more telephone numbers to be looked up, using the company name as a key, and returned by SMS to the requesting handset.

20   The service may, for example, be marketed as '*Easy-123*' . If, a mobile user wants to find out the customer enquiry number of, say, the Dodgem car company, he uses his mobile handset to enter an SMS message consisting of simply the text:

dodgem

He then sends this SMS message to the number 123. An SMS message is then

25   returned by the server. The reply may typically contain the text:

Dodgem UK: Book a test drive 0990 1234567. Helpdesk: 0800 1234567 9am-5pm, 7 days a week.

If he decides to call the second number immediately, he can use his phone's SMS number extraction feature to pick out the number 0800 1234567 and dial it. He is

30   then connected to the desired Dodgem customer service line. The entire SMS message is also retained in the handset for future use.

Although the invention has been described in the context of particular embodiments, it will be apparent that it may be implemented in other ways. In particular, features of the invention such as the text processor, data store, and possibly also the audio signal processor may be distributed or configured in a different manner
5   in order to provide alternative implementations.

CLAIMS

1.   A telecommunications services apparatus for use in operative association with a telecommunications system, said telecommunications system having a plurality of communications terminals which provide a facility for telecommunications, said
5   telecommunications apparatus comprising

-    a text processor coupled to said telecommunications system and also coupled to an associated data store which has stored therein information capable of association with data entered from a communications terminal and so organised that in response to data entered from a communications terminal
10   the text processor will return the associated information from the data store to the said communications terminal and/or to another selected communications terminal.

2.   A telecommunications services apparatus as claimed in Claim 1 including a
15   plurality of data stores.

3.   A telecommunications services apparatus as claimed in Claim 2 wherein access to one of said data stores is restricted to a closed user group of communications terminals.
20

4.   A telecommunications services apparatus as claimed in any preceding claim whereby an internet is operable so as to provide said data store or one of said data stores.

25   5.   A telecommunications services apparatus as claimed in any preceding claim comprising an audio signal processor coupled to the text processor whereby said retrieved information includes data representative of audio signals wherein said audio signal processor operates to generate and deliver audio information.

30   6.   A telecommunications services apparatus as claimed in Claim 5, wherein said audio information is delivered to said communications terminal.

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7.   A telecommunications services apparatus as claimed in Claim 5, wherein said audio information is delivered to another selected communications terminal.

8.   A telecommunications services apparatus as claimed in any preceding claim wherein the telecommunications system is a mobile telephone network.

9.   A telecommunications services apparatus as claimed in any preceding claim wherein the information sent to and from the text processor is in short message service (SMS) form.
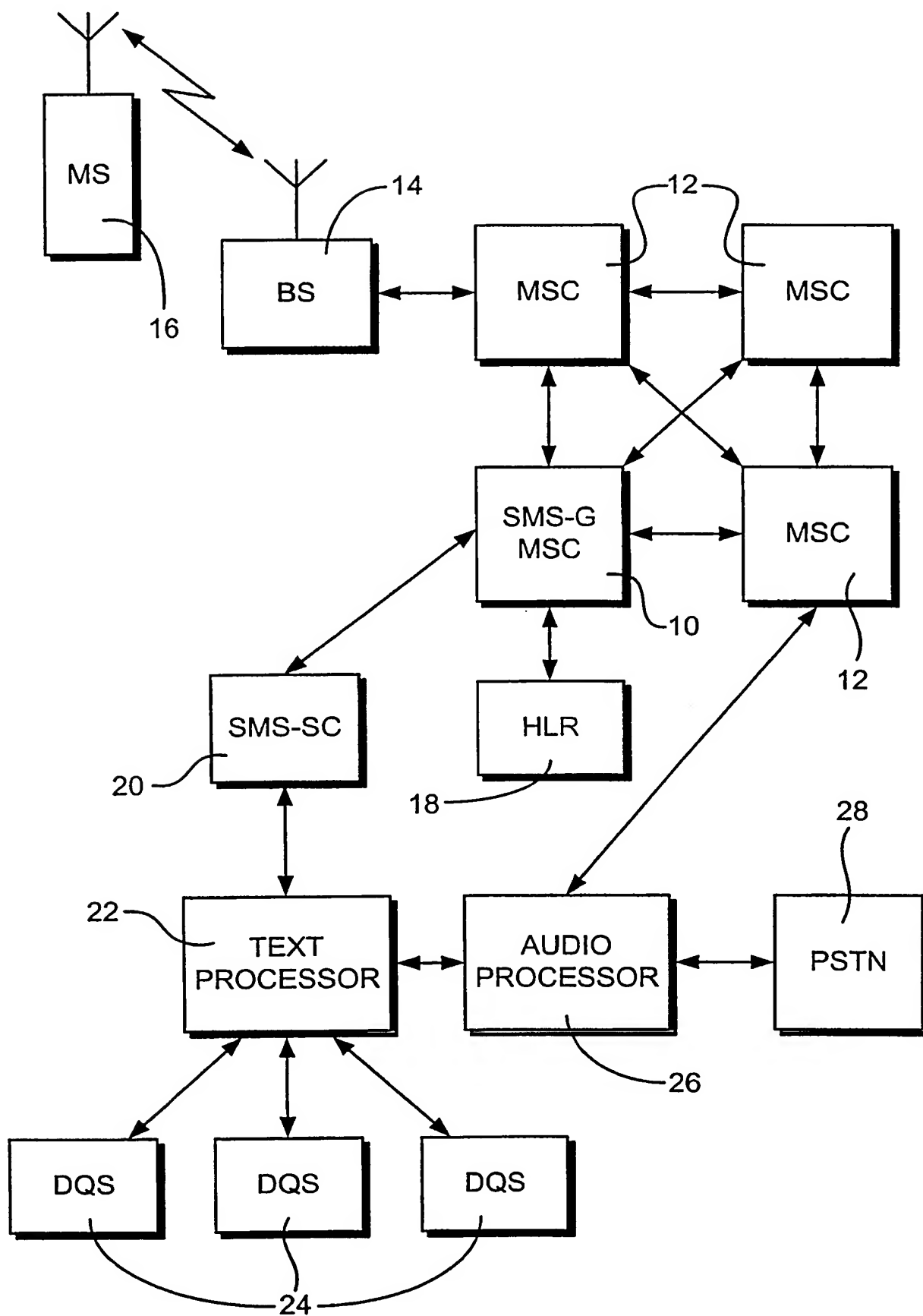
INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7   H04Q7/22

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7   H04Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ, IBM-TDB, INSPEC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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[X] Further documents are listed in the continuation of box C.   [X] Patent family members are listed in annex.

* Special categories of cited documents :

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Date of the actual completion of the international search	Date of mailing of the international search report
27 October 2000	07/11/2000

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Gijsels, W

Form PCT/ISA/210 (second sheet) (July 1992)

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

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